Claims

1. Tool (7) for handling a wafer (100), particularly a semiconductor material wafer, in an epitaxial growth station (1), preferably of the type with a disk-shaped susceptor, the tool (7) being adapted to be applied to an arm (5) of a robot (4) for the automatic insertion/extraction of wafers into/from the reaction chamber (2) of the station (1), the arm (5) being provided with a suction duct (6) connected to a suction system (3), the tool (7) comprising a disk (20) having an upper side (21) and a lower side (22), the lower side (22) being so shaped as to get in contact with the wafer (100) only along the edge (103) of the wafer (100), the disk (20) being provided internally with a suction chamber (24) that is in communication with the outside of the disk (20) through one or more suction holes (25) and that is adapted to be put in communication with the suction duct (6) through a suction port (26), characterized in that the disk (20) is such as to entirely cover the wafer (100) and in that the suction hole/holes (25) opens/open to the lower side (22) of the disk (20), whereby, when the wafer (100) is in contact with the lower side (22) of the disk (20) and the suction system (30) is active, the wafer (100) is held by the tool (7) through suction.

2. Tool according to claim 1, wherein the disk (20), on its lower side (22) in its central part, is provided with a suction cavity (27), and wherein the hole/holes (25) opens/open to the lower side (22) of the disk (20) into the suction cavity (27).

3. Tool according to claim 1 or 2, wherein the suction port (26) opens to the upper side (21) of the disk (20).

4. Tool according to any of the preceding claims, wherein the disk (20) comprises a shell (28), having outline being substantially ring-shaped and cross-section being substantially U-shaped, and a lid (29), being substantially flat and being substantially circle-shaped, joined to the shell (28) in such a way as to form a closed chamber (24) corresponding to the suction chamber and a cavity (27) being substantially cylinder-shaped and corresponding to the suction cavity, and wherein the shell (28) is so shaped as to get in contact with the wafer (100) only along the edge (103) of the wafer (100).

5. Tool according to claim 4, wherein the suction holes (25) open to the lateral walls of the cylinder-shaped cavity (27).

6. Tool according to claim 4, wherein the suction holes (25) consist of grooves made on the inner lip of the shell (28) at the border with the lid (29).

7. Tool according to any of the preceding claims, wherein the disk (20) is provided with a plate (23) for applying the tool (7) to the arm (5) of the robot (4), and wherein the suction port (26) opens to or next to the plate (23).

8. Tool according to any of claims from 4 to 6, wherein the lid (29) is provided with a plate (23) for applying the tool (7) to the arm (5) of the robot (4), and wherein the suction port (26) opens to or next to the plate (23).

9. Station for epitaxial growth treatment of wafers, particularly semiconductor material wafers, comprising a reaction chamber (2), a suction system (3) and a robot (4) for the automatic insertion/extraction of wafers into/from the reaction chamber (2), the robot (4) being provided with an arm (5) having a suction duct (6) connected to the suction system (3), characterized in that it comprises a tool (7) according to any of the preceding claims provided with a suction chamber (24) and adapted to handle a wafer (100), the tool (7) being applied to the arm (5) of the robot (4) and the suction chamber (24) being in communication with the suction duct (6).

10. Station according to claim 9, wherein the reaction chamber (2) is of the type with a disk-shaped susceptor (9).

11. Station according to claim 9 or 10, wherein the arm (5) of the robot (4) essentially consists of a tube (6) that also acts as suction duct.

12. Station according to claim 11, wherein the arm (5) of the robot (4) comprises a plate (10), joined to one end of the tube (6), adapted to be applied to the tool (7), particularly to the plate (23) of the tool (7), and provided with an internal duct (11) that puts the tube (6) of the arm (5) in communication with the suction port (26) of the disk (20).

13. Station according to any of the preceding claims, wherein the reaction chamber (2) houses a support (9) that is provided with at least one pocket (12) for seating a wafer to be treated (200) in the station (1), the pocket (12) consisting of a first cavity (121) and a second cavity (122) formed within the first cavity (121) and having a substantially flat bottom and having a shape and a size corresponding to the wafer to be treated.

14. Station according to claim 13, wherein the depth of the second cavity (122) is smaller than the width of the wafer (200) to be treated.

15. Station according to claim 13 or 14, wherein the overall depth of the first cavity (121) and of the second cavity (122) is larger than the width of the wafer (200) to be treated.

16. Station according to any of the preceding claims, wherein the suction system (3) is adapted to realize a suction that depends on the wafer handling phase.

17. Station according to claim 16, comprising an inlet area (13) for wafers to be treated, an outlet area (13) for wafers already treated, and a treatment area (2), wherein the suction system (3) is adapted to realize :

- a suction of a first value during a phase of transferring a wafer from the inlet area (13) to the treatment area (2) and during a phase of transferring a wafer from the treatment area (2) to the outlet area (13),
- a suction of a second value during a phase of picking up a wafer from the inlet area (13),
- a suction of a third value during a phase of picking up a wafer from the treatment area (2);

and wherein the third value is bigger than the second value and the second value is bigger than the first value.

18. Station according to any of the preceding claims, wherein the suction system (3) is adapted to cause such a pressure depression in the space between the disk (20) and the handled wafer (100) as to cause no damage to the structure or to the surfaces of the handled wafer (100).

19. Station according to any of the preceding claims, wherein the suction system (3) is of the type operating by Venturi effect.

20. Station according to claim 19, wherein the suction system (3) comprises a programmable Mass Flow Controller [MFC] for controlling the flow of inert gas.